Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use of the 3.7-4.2 GHz Band	)	GN Docket No. 18-122
	)	
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rule to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band	)	RM-11791
	)	
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared between the Fixed Service and the Fixed Satellite Service	)	RM-11778

REPLY COMMENTS OF RAYTHEON COMPANY

Raytheon Company ("Raytheon"), by its attorney, hereby submits its reply to comments filed in response to the May 3, 2019, Public Notice in the above-captioned proceeding.[1] As Raytheon submitted in its opening comments, the Commission should maintain focus on protecting incumbent earth station operators and entitling them to full reimbursement should they have to modify or relocate their operations even as it considers enabling new terrestrial entrants in the 3.7-4.2 GHz Band (referenced herein as the "C-Band"). Raytheon's reply focuses on these principles and some of the comments that challenge them.[2]

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[1] *Expanding Flexible Use of the 3.7-4.2 GHz Band,* Public Notice, GN Docket No. 18-122, DA 19-385 ("Public Notice"). Unless otherwise noted herein, references to "Comments" of a party refer to comments filed by that party on July 3, 2019, in GN Docket No. 18-122 (and perhaps other dockets and files).

[2] Raytheon takes no position at this time on matters not expressly discussed herein or in its initial comments, such as whether a "market-based" realignment, or "private auction," as proposed by the C-Band Alliance ("CBA") is permitted; what constitutes a "fundamental change" to a Fixed Satellite Service ("FSS") space station authorization under Section 316 of the

Status of Incumbent Registered Earth Stations. The opening comments diverge on the issue of whether earth station registrations should be treated as "licenses" for purposes of Section 309(j) of the Communications Act. On this issue, the Commission's historical treatment concerning the authorization of earth stations is of considerable relevance and weight, as numerous commenters note.[3] While the Commission's regulatory framework for receive-only earth stations over the past few decades has progressed from mandatory licensing, to permissive licensing, to mandatory non-licensing (i.e., permissive registration with licenses limited to earth stations communicating with non-U.S. space stations), the important central feature remain unchanged: the Commission has consistently and continuously recognized that receive-only earth stations, like licensees, remain entitled to protection from harmful interference as was the case before the authorization requirements were first streamlined.[4] In other words, the administrative load for receive-only earth stations to operate has been lightened by the Commission, but not their status as a user of spectrum which fits the definition of "license" as an authorization for the "the use or operation of apparatus for transmission . . . communications . . . by radio."[5]

Communications Act; or which authorized C-Band space station operators would be entitled to participate in an incentive auction.

3 *See, e.g.,* Comments of NPR at 3-4; Comments of BYU Broadcasting at 6-8.

4 *See* Comments of NPR at 4 (citing the Public Notice at 6 (the registration program "affords the same protection from interference as would a license issued under [the FCC's licensing] procedure"), quoting *Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed–Satellites at Reduced Orbital Spacings and to Revise Application Processing Procedures for Satellite Communications Services*, First Report and Order, 6 FCC Rcd 2806, 2807 (1991)).

5 *See* 47 U.S.C. §153(49). As the history of the Commission's licensing and registration framework for receive-only earth station makes plain, transmission is not a requisite qualification for the issuance of a license. Indeed, while the definition of "license" includes "instrument[s] of authorization . . . for the use or operation of apparatus for transmission of energy . . . by radio, *id.*, the Communications Act makes clear that "transmission of energy by radio" includes not just transmission, but also "all instrumentalities, facilities, and services incidental to such transmission." *Id.* §153(57). The operation of receive-only earth stations in the 3.7-4.2 GHz are unquestionably incidental to the transmissions of C-Band space stations.

Consequently, in response to the Public Notice, strong arguments have been made that earth station registrations should be treated as licenses and, as a result, earth station operators should properly be treated as licensees for purposes of Section 309(j). Raytheon submits that this interpretation merits serious consideration and is not as easily dismissed as its detractors would prefer.

As Raytheon explained in its opening comments, if there is a realignment of the 3.7-4.2 GHz Band, the public interest entitles receive-only earth station operators for any costs they incur as a result independent of how any such realignment is effectuated.[6] That outcome is further strengthened in no small part because of the strength of the arguments that registered earth station operators should be deemed "licensees" for purpose of Section 309(j) – regardless how the Commission comes out on that definitional question.

Proponents of Moving Earth Stations to Fiber Gloss over Serious Problems. Raytheon has grave concerns about the feasibility and practicality of the fiber solutions proposed by Charter/ACA/CCA and by T-Mobile.[7] While at first blush, such suggestions may hold some superficial appeal, they fail to fairly account for the full scope of the wireline architecture and system planning that would be required to connect the 140+ NOAA locations served by the existing earth stations supported by Raytheon and described in its opening comments.[8] This situation, considering the band as a whole, is magnified many times, given, as the CBA recently

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6 *See* Comments of Raytheon at 3-4.

7 *See*, e.g., Letter of Charter Communications, Inc. ("Charter"), ACA Connects ("ACA"), and Competitive Carriers Association ("CCA"), GN Docket No. 18-122 (filed July 2, 2019) ("Charter/ACA/CCA Letter"); Comments of T-Mobile at 9.

8 Comments of Raytheon at 2-3.

pointed out, the connection of the "hundreds of content providers to over ten thousand earth stations" for video distribution.[9]

As an initial matter, it is unclear whether the performance and reliability of data and content distribution through C-Band satellites could be replicated through a transfer to fiber distribution. Regardless, given the presumed need for dedicated connections, a transfer of any appreciable amount of the content and data supported by C-Band earth station operations to a managed fiber solution would require extensive planning, would cost substantial amounts of money (whether or not fiber is present at the requisite locations, which is a matter that would require extensive examination but which has not yet been undertaken), may require the laying of additional fiber to reach many specific locations, and would take years to complete. These hurdles have not been sufficiently characterized and quantified by the fiber solution proponents.

Moreover, during any such transition, any flexible-use new entrants into the Band would have to protect the existing earth stations on their current frequencies to avoid disruption, potentially delaying flexible use access to any part of the Band relative to other methods under consideration.[10] A transition of some fraction of the incumbent earth stations to fiber would also raise an additional layer of question of ongoing cost compensation should the fiber alternative be more expensive on an ongoing basis than continued satellite downlinks. To this last point, Raytheon suggests that proponents of a transition to fiber conduct further study on long term

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[9] *See* Letter of Jennifer Hindin, Wiley & Rein LLP, Counsel for the C-Band Alliance ("CBA"), to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 2, 2019).

[10] In the alternative, theoretically speaking, existing earth stations in the portion of the C-Band to be made available for flexible use that would be transitioned to fiber could conceivably be relocated to a segregated portion of the band on a temporary basis (before the ultimate transition to fiber), so as to expedite flexible use access to the lowest portion of the band. In this scenario, however, the planning burden would effectively double, and the costs of reimbursing such earth station operators for both the temporary and the permanent transitions would increase materially.

costs to potentially affected earth station operations, taking into account the various uses and demands that characterize such earth stations.

Amount of the Band to Be Made Available for Flexible Use. In conjunction with their suggestion that a substantial portion of the existing C-Band operations can be transitioned to fiber, the Charter/ACA/CCA Letter contends that 370 megahertz of the C-Band can be made available for flexible use through auction.[11] It remains unclear from the Charter/ACA/CCA submission how these parties arrived at this number, which they contend is merely a floor. The Charter/ACA/CCA Letter proposal notably leaves no more than 43% (i.e., 130 of 300 megahertz) of the spectrum that the CBA – backed by all four of the current C-Band satellite operators in the United States – concluded in its proposal would be required to accommodate existing satellite operations. No doubt, Charter/ACA/CCA assume a generous number of earth station operators would leave the band altogether, *e.g.*, go to fiber (or perhaps transition to Ku-Band spectrum which earth station operators have made clear in the record is a very poor substitute for C-Band in terms of reliability and performance). Before the Commission could even begin to entertain this proposal, adequate demonstrations will be needed that only 130 megahertz would be sufficient to accommodate existing satellite operations currently conducted within the 500 megahertz of the Band that could not be comparably and timely accommodated with out-of-band solutions, including providing the ongoing operational flexibility required by earth stations which is discussed in the next section.

Retention of the Full-Band Full-Arc Policy. Several of the parties commenting on the Commission's Public Notice take the occasion to resume the campaign for entry into the upper

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[11] *See* Charter/ACA/CCA Letter at 3 (claiming their proposal will "free[] up at least 370 megahertz (and likely more)").

portion of the band not made available for flexible use through auction of point-to-multipoint ("P2MP") fixed services on a shared and coordinated basis with satellite services.[12] In principle, Raytheon does not oppose such entry, but only on the condition that the full-band, full-arc policy is retained in the portion of the band that remains available to the FSS. As Raytheon explained in detail in a letter filed in this docket on July 5, 2018, the full-band, full-arc policy serves an important and necessary practical purpose, affording earth station operators the flexibility to continue their operations free from harmful interference.[13] While the policy was adopted to protect earth stations from conventional point-to-point links, it should apply equally to P2MP attempts to share the C-Band with FSS.

Earth station configurations in the band are not static in at least two ways, regardless of whether they support the media and entertainment industry, other industries, or the government and other institutions, as Raytheon observed:

> First, installed earth stations, without changing location, may have to reorient to new satellites in the orbital arc or may have to tune to new frequencies in the band. Such changes will alter the profile for potential interference into the earth station from other proximate radio station operators operating in adjacent or co-channel spectrum. Reorientation may occur because a transponder lease or service contract expires. This may also be necessary as a result of satellite failure or degradation of performance, which may entitle the earth station operator to adjust by reorienting and/or moving to a new frequency. Other causes may have the same effect. Registered or licensed earth stations in the 4 GHz Band that need to reorient, often for reasons outside their control, should not lose any interference protection to which they are entitled.
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> Second, as with the reorientation or retuning of earth stations, the need for operators to change the location of 4 GHz receive-only earth stations is not uncommon in the regular course of operations. This can happen for several reasons. For instance, property leases underlying the earth station

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12 *See, e.g.,* Comments of The Wireless Internet Service Providers Association at 15-16; Comments of Google LLC at 8-13.

13 *See* Letter of Edward A. Yorkgitis, Jr., Kelley Drye & Warren LLP, counsel to Raytheon Company, to Marlene Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 5, 2018).

> deployment may expire or, alternatively, be terminated prior to expiration due to a variety of causes, many unrelated to any fault by the earth station operator. Alternately, there may be environmental or other impacts that develop after an earth station is installed that force an earth station operator to move its location. Or an earth station may have to repoint to a new satellite, but the existing site is not suitable for such reorientation due to obstructions, frequency management issues, or for other reasons. It is also possible that an earth station operator might consider moving to accommodate another operator of a different service that wishes to deploy in its vicinity.[14]

Consequently, to afford earth station operators adequate protection from interference, now and in the long-run, the Commission should retain the flexibility required by earth station operators to retune, reorient, and relocate their station locations to ensure continuity of service by keeping the full-band, full-arc policy in place. The policy's importance will be magnified as a tool to permit new fixed service entrants, whether individual links or P2MP, while ensuring earth station operators continue to be protected, to the extent the amount of spectrum remaining for the FSS is reduced as the result of flexible use entry into the lower portion of the band.[15]

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[14] *Id.* at 3-4.

[15] Raytheon submits that registered receive-only earth stations are as fully entitled to protection from (and have the right to complain about) harmful interference from P2MP operations as they were/are from "conventional" fixed services under the current allocation framework which will not change. There is no reason that P2MP operations should have a greater priority in the band than conventional fixed service point-to-point links, particularly if FSS must operate in a smaller portion of the band than currently and are entitled to comparable facilities.

In conclusion, for the reasons above and in Raytheon initial comments, to the extent the Commission adopts rules to realign the 3.7-4.2 GHz band to permit new entrants, the public interest requires the Commission to take appropriate measures to protect earth station operators and require reimbursement to them for any expenses required to move to new frequencies where they can be ensured protection.

Respectfully submitted,

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